

REMARKS

Claims 1-25 are all the claims pending in the application. Support for the amendments to claims 1 and 18 may be found in the specification as originally filed, for example, at page 49, lines 1-10.

I. The Rejection Under 35 U.S.C. §112

Claims 1-25 are rejected under 35 U.S.C. § 112, first paragraph, as allegedly containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

In particular, the Examiner states that claim 1 recites that R₆ and R₇ is a group exclusive of hydrogen atom, yet this claimed feature is not supported by the specification as recited. The Examiner particularly notes that compounds of Applicants' specification, pages 98-113, wherein the groups defined for R₆ and R₇ include alkyl groups which have hydrogen atoms.

Applicants respectfully submit that the present specification provides a fully enabling disclosure for the invention, as claimed, and that the disclosure would enable one of ordinary skill in the art to make and use the invention, as claimed, without undue experimentation. Further, Applicants respectfully submit that the present claims are clear and definite as written and that they particularly point out and distinctly claim the subject matter which Applicants regard as the invention.

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Applicants request that the Examiner reconsider and withdraw the §112, first paragraph, rejection in view of the following remarks.

One of ordinary skill in the art, in view of Applicants' disclosure and the knowledge in the art, would be able to make and use Applicants' invention, regardless of whether the Examiner's interpretation of the claim language is correct. Thus, the issue raised by the Examiner does not appear to be an enablement issue.

Applicants' respectfully traverse the Examiner's interpretation of the meaning of Applicants' original claim language. Applicants' original claim language recited that at least one of R₆ and R₇ is not a hydrogen atom, not that at least one of R₆ and R₇ does not contain hydrogen atoms.

Further, in order to further prosecution, claims 1, 9 and 18 have been amended to clarify the language and to more particularly point out and distinctly claim Applicants' invention.

For the above reasons, it is respectfully submitted that Applicants' claims are fully enabled by Applicants' specification and that one of ordinary skill in the art would be able to practice the claimed invention without undue experimentation and it is requested that the rejection under 35 U.S.C. §112, first paragraph, be reconsidered and withdrawn.

II. The Rejections Under 35 U.S.C. §102

Claims 1, 2, 6, 8, 10, 18, 19, 23 and 25 are rejected under 35 U.S.C. 102(e) as allegedly being anticipated by Hada et al or Aoai et al.¹

Applicants respectfully submit that the present invention is not anticipated by or obvious over Hada et al or Aoai et al and request that the Examiner reconsider and withdraw this rejection in view of the following remarks.

Applicants respectfully traverse the Examiner's rejection based on Hada et al. Applicants have amended claims 1 and 18 to recite that the repeating units are represented by formula (AI). Further, as A' in formula (AI), Applicants have amended claims 1 and 18 to recite that the repeating units of formula (AI) have a single bond in the A' position. It is respectfully submitted that Hada et al does not teach or disclose photoresist compositions having repeating units represented by formula (AI) and a single bond in the A' position.

Applicants respectfully traverse the Examiner's rejection based on Aoai '991. Example 29 of Aoai '991 contains a polymer with monomer "b14." Monomer b14 is not within the scope of Applicants' claimed formula (I). Monomer b14 has the structure -C(O)-O-CH₂-C(CH₃)(H)-. Applicants' formula (I) has the structure

¹ The Examiner has listed Aoai, USP 6,042,991, and Aoai, USP 5,824,451, in the Form 892 attached to the Office Action. It appears that the §102 rejection is based on Aoai, USP 6,042,991.

-C(O)-O-C(R₆)(R₇)-. Thus, Monomer b14 of Aoai '991 contains a -CH₂- group between the -C(O)-O- substituent and the -C(R₆)(R₇)- substituent.

Further, none of the "b" monomers of Aoai '991 (b1-b30) contain a -C(O)-O-C(R₆)(R₇)- type of structure.

It is respectfully submitted that Aoai et al does not teach or disclose Applicants' claimed photoresist compositions.

For the above reasons, it is respectfully submitted that the subject matter of claims 1, 2, 6, 8, 10, 18, 19, 23 and 25 is neither taught by nor made obvious from the disclosures of Hada et al or Aoai et al and it is requested that the rejections under 35 U.S.C. §102 be reconsidered and withdrawn.

III. The Rejection Under 35 U.S.C. §103

Claims 1-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hada et al and Aoai et al in combination.²

The Examiner states that Hada et al lacks the embodiments as recited in claim 3 for the substituent groups R₂₉, R₃₀ and R₃₁. The Examiner also notes that Hada et al lacks the explicit use of amine compounds and fluorine containing surfactants in their examples.

² The Examiner has listed Aoai, USP 6,042,991, and Aoai, USP 5,824,451, in the Form 892 attached to the Office Action. It appears that the §103 rejection is based on Aoai, USP 6,042,991.

The Examiner cites Aoai '991 as disclosing copolymers of an adamantyl group containing a carboxyl-substituted group and other groups, which the Examiner alleges meet the claimed scope of Applicants' claim 3. The Examiner states that the adamantyl groups having the substituted side groups are not explicitly disclosed in any examples in Aoai '991, but the Examiner concludes that such substituents are clearly taught as suitable copolymers by Aoai '991.

The Examiner further states that Aoai '991 discloses the use of additive ingredients to include amine compounds and surfactants, including fluorine containing surfactants.

The Examiner concludes that it would have been *prima facie* obvious to one of ordinary skill in the art of photoresist compositions to use additive components such as fluorine containing surfactants to improve coating properties and to add amines as acid diffusion inhibitors and reasonably expect photoresist compositions with excellent pattern profiles and pattern resolution.

The Examiner also concludes that it also would have been *prima facie* obvious to one of ordinary skill to use the substituted adamantyl groups having carboxyl-containing substituents as seen in the monomer groups of (a6), (a25), (a26), (a27), (a33), (a52), (a53) and (a54) and reasonably expect same or similar results with respect to excellent pattern profile and pattern resolution.

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Applicants respectfully submit that the present invention is not anticipated by or obvious over Hada et al in view of Aoai et al and request that the Examiner reconsider and withdraw this rejection in view of the following remarks.

Applicants' position concerning the disclosures of Hada et al and Aoai et al remain as stated in Section II above. The combination of the disclosures of Hada et al with those of Aoai et al do not overcome the differences between the repeating units of Applicants claims and the repeating units disclosed in Hada et al and Aoai et al.

While, as set forth above, it is believed the Examiner has not established a prima facie case of obviousness, to advance the prosecution of the case, Applicants provide declaration evidence showing the improved properties of the presently claimed photoresist composition over the materials of the references of the rejection.

In particular, as shown in the comparative data of the Declaration, by the use of Applicants' claimed photoresist compositions and repeating units, as compared with the copolymer A4 of Hada et al, unexpected superiority in sensitivity, resolution and edge roughness are achieved.

For the above reasons, it is respectfully submitted that the subject matter of claims 1-25 is neither taught by nor made obvious from the disclosures of Hada et al et al or Aoai et al, either alone or in combination, and it is requested that the rejection under 35 U.S.C. §103(a) be reconsidered and withdrawn.

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IV. Conclusion

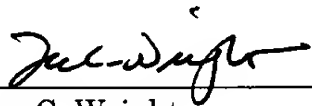
In view of the above, Applicants respectfully submit that their claimed invention is allowable and ask that the rejection under 35 U.S.C. §112, the rejections under 35 U.S.C. §102 and the rejection under 35 U.S.C. §103 be reconsidered and withdrawn. Applicants respectfully submit that this case is in condition for allowance and allowance is respectfully solicited.

If any points remain at issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the local exchange number listed below.

Applicants hereby petition for any extension of time which may be required to maintain the pendency of this case, and any required fee for such extension is to be charged to Deposit Account No. 19-4880.

Respectfully submitted,

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Date: February 4, 2002

APPENDIX

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

The claims are amended as follows:

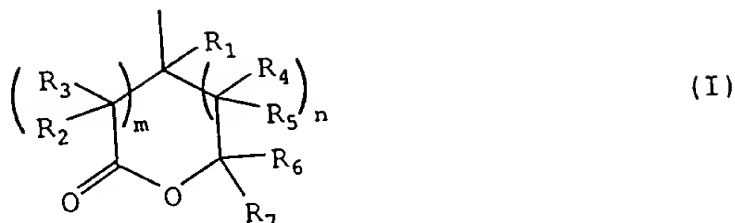
1 (Amended). A positive photoresist composition comprising:

(A) a compound capable of generating an acid upon irradiation with actinic rays or radiation and

(B) a resin capable of decomposing under the action of an acid to increase the solubility in alkali, containing a repeating unit [having a group] represented by the following formula [(I)] (AI):



wherein R represents hydrogen atom, a halogen atom, a substituted or unsubstituted alkyl group having from 1 to 4 carbon atoms, A' represents a single bond and B represents a group represented by formula (I):



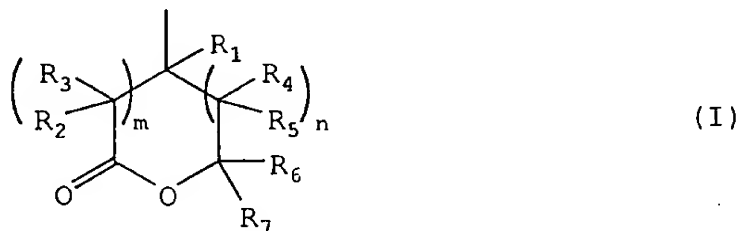
wherein R_1 represents hydrogen atom or an alkyl group having from 1 to 4 carbon atoms, which may have a substituent, R_2 to R_7 , which may be the same or different, each represents hydrogen atom, an alkyl group which may have a substituent, a cycloalkyl group which may have a substituent or an alkenyl group which may have a substituent, provided that at least one of R_6 and R_7 is [a group exclusive of] not a hydrogen atom and R_6 and R_7 may combine to form a ring, and m and n each independently represents 0 or 1, provided that m and n are not 0 at the same time.

9 (Amended). A positive photoresist composition for far ultraviolet exposure, comprising:

(A) a compound capable of generating an acid upon irradiation with actinic rays or radiation,

(B) a resin capable of decomposing under the action of an acid to increase the solubility in alkali, containing a repeating unit having a group represented by the following formula (I), and

(C) a fluorine-containing and/or silicon-containing surfactant:



wherein R₁ represents hydrogen atom or an alkyl group having from 1 to 4 carbon atoms, which may have a substituent, R₂ to R₇, which may be the same or different, each represents hydrogen atom, an alkyl group which may have a substituent, a cycloalkyl group which may have a substituent or an alkenyl group which may have a substituent, provided that at least one of R₆ to R₇ is [a group exclusive of] not a hydrogen atom and R₆ and R₇ may combine to form a ring, and m and n each independently represents 0 or 1, provided that m and n are not 0 at the same time.

18 (Amended). A positive photoresist composition for far ultraviolet exposure, comprising:

(A) a compound capable of generating an acid upon irradiation with actinic rays or radiation,

(B) a resin capable of decomposing under the action of an acid to increase the solubility in alkali, containing a repeating unit [having a group] represented by the following formula [(I)] (AI), and

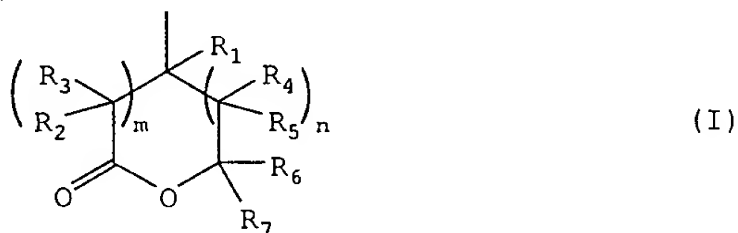
(D) a solvent containing the following solvent (a) in an amount of 60% to 90 wt % based on the entire solvent:

(a) at least one first solvent selected from propylene glycol monomethyl ether acetate, propylene glycol monomethyl ether propionate, methyl

3-methoxypropionate, ethyl 3-methoxypropionate, methyl [3-ethoxypropionate and]
3-ethoxypropionate and ethyl 3-ethoxypropionate[:]



wherein R represents hydrogen atom, a halogen atom, a substituted or unsubstituted alkyl group having from 1 to 4 carbon atoms, A' represents a single bond and B represents a group represented by formula (I):



wherein R₁ represents hydrogen atom or an alkyl group having from 1 to 4 carbon atoms, which may have a substituent, R₂ to R₇, which may be the same or different, each represents hydrogen atom, an alkyl group which may be substituent, a cycloalkyl group which may have a substituent or an alkenyl group which may have

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a substituent, provided that at least one of R_6 and R_7 is [a group exclusive of] not a hydrogen atom and R_6 and R_7 may combine to form a ring, and m and n each independently represents 0 or 1, provided that m and n are not 0 at the same time.